



Coastal Protection and  
Restoration Authority of Louisiana

**State of Louisiana  
Coastal Protection and Restoration  
Authority**

**2012 Annual Inspection Report**

for

**BRADY CANAL HYDROLOGIC  
RESTORATION PROJECT (TE-28)**

State Project Number TE-28  
Priority Project List 3

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Terrebonne Parish

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## **I. Introduction**

The Brady Canal Hydrologic Restoration Project consists of 7,653 acres located in the Terrebonne Basin, within the Bayou Penchant - Lake Penchant watershed in Terrebonne Parish, Louisiana. The project is bounded by Bayou Penchant, Brady Canal, and Little Carencro Bayou to the north, Bayou Decade and Turtle Bayou to the south, Superior canal to the east, and Little Carencro Bayou and Voss Canal to the west (Appendix A – Project Features Map).

The Brady Canal Project is a hydrologic restoration project consisting of the installation and maintenance of a fixed crest weir with barge bay, a rock plug, several variable crest weir structures, earthen embankments and overflow banks, rock dikes, rock armored earthen embankments and rock armored channel liners. These structures were designed to reduce the adverse tidal affects and saltwater intrusion in the project area and to promote freshwater introduction for better utilization of available freshwater, and retain sediment, as well as to encourage re-establishment of emergent and sub-aquatic vegetation in eroded areas (Folse, August 2003)

The Brady Canal Hydrologic Restoration Project (TE-28) is co-sponsored by the Natural Resource Conservation Service (NRCS) and the Coastal Protection and Restoration Authority (CPRA) of Louisiana. The project was authorized by Section 303(a) of Title III Public Law 101-646, the Coastal Wetlands Planning Protection and Restoration Act (CWPPRA) enacted on November 29, 1990 as amended and approved on the third Priority Project List.

## **II. Inspection Purpose and Procedures**

The purpose of the annual inspection of the Brady Canal Hydrologic Restoration Project (TE-28) is to evaluate the constructed project features, identify any deficiencies, and prepare a report detailing the condition of the project features including recommendations for corrective actions, as needed. Should it be determined that corrective actions are required, CPRA shall provide in the inspection report, a detailed cost estimate for engineering, design, bidding, construction oversight and supervision, project contingencies, and an assessment of the urgency of such repairs (LDNR\_CRD; Pyburn and Odom, 2002 OM&R Plan). The annual inspection report also contains a summary of the completed maintenance projects and an estimated projected budget for the upcoming three (3) years for operations, maintenance and rehabilitation. The three (3) year projected operations and maintenance budget is shown in Appendix C. A summary of completed operation and maintenance projects are outlined in Section IV of this report.

An inspection of the Brady Canal Hydrologic Restoration Project (TE-28) was held on February 7, 2012 with clear skies and low wind. In attendance for the inspection were Brian Babin, Shane Triche, and Adam Ledet from CPRA, Francis Fields from Apache Minerals, Inc., Ordis “Buddy” Smith from ConocoPhillips, and Dain Gillen from NRCS. All attendees met at the Falgout Canal Boat Launch and traveled to the project area by boat. The inspection began at the intersection of Bayou Decade and Turtle Bayou, progressed along the perimeter

of the project area including the lake rim of Jug Lake, and concluded along the Brady Canal near the Apache Camp.

The field inspection included a complete visual inspection of all constructed features within the project area. Photographs of all project features were taken during the field inspection and are shown in Appendix B. Staff gauge readings, where available, were documented and used to estimate approximate water elevations, elevations of rock weirs, earthen embankments, and other project features.

### **III. Project Description and History**

The Brady Canal Hydrologic Restoration project is bisected by the Mauvais Bois Ridge, resulting in different hydrologic regimes to the north and south of the ridge. The northern section of the project area receives freshwater and sediments which are provided by over-bank flow from Bayou Penchant, Little Carencro Bayou, and Brady Canal (USDA/NRCS 1995). The Mauvais Bois Ridge forms a barrier through the project area reducing the outflow of freshwater to the southern portion of the project area. Freshwater and sediment retention in the southern portion of the project area has diminished due to unimpeded through-flow and tidal exchange combined with a lack of freshwater introduction from the north (USDA/NRCS 1995). In addition, oilfield access canals extending from within the project area to the Bayou Decade levee ridge have also increased tidal exchange and provided direct routes for saltwater intrusion and a reduction in freshwater and sediment retention (USDA/NRCS 1995).

Major changes to the hydrology of the Penchant Basin, both natural and human induced, have resulted in a complex hydrologic setting (USDA/NRCS 1995). Under natural hydrologic conditions, the Penchant Basin is confined by natural levee ridges and is open to the west and southwest where it connects with the Lower Atchafalaya River, Atchafalaya Bay, and Fourleague Bay. Historically, this hydrologic setting produced an estuarine system created by freshwater introduction in the upper basin and tidal exchange with the bays. Over time, hydrologic conditions in the Penchant Basin were altered by the construction of numerous canals, levees, local water management structures, and major public works projects. Some of the major projects that have contributed to the change in the hydrologic conditions of the basin are the Atchafalaya Basin Floodway, the Avoca Island Levee project along the Lower Atchafalaya River, the Gulf Intracoastal Waterway (GIWW), the Bayou Chene, Boeuf, and Black Projects, the rock weir at Wax Lake, and the Houma Navigation Canal (USDA/NRCS 1995).

The objective of the Brady Canal Hydrologic Restoration Project is to maintain and enhance existing marshes in the project area by reducing the rate of tidal exchange and improving the retention of introduced freshwater and sediment (Folse T., 1998). Specific goals of the project are to (1) decrease the rate of marsh loss, (2) maintain or increase the abundance of plant species typical of a freshwater and intermediate marsh, (3) decrease variability in water level within the project area, (4) decrease variability in salinities in the southern portion of the project, (5) increase vertical accretion within the project area and (6) increase the frequency of occurrence of SAV within the project area. (Folse T., 1998)

The Brady Canal Hydrologic Restoration Project (TE-28) was completed in July 2000 and involved the installation of the following project features:

Structure 6 – fixed crest weir with barge bay  
Structure 7 – rock plug  
Structure 10 – stabilization rock armored channel liner  
Structure 14 – fixed crest weir with variable crest section  
Structure 20 – stabilization rock armored channel liner  
Structure 21 – fixed crest weir with three (3) variable crest sections  
Structure 23 – fixed crest weir with two (2) variable crest sections  
Structure 24 – fixed crest weir  
4,405 linear ft. – rock armored earth embankment  
3,660 linear ft. – rock dike  
8,531 linear ft. – Earthen embankment  
Maintenance of existing over-flow banks (21,600 ft.)

#### **IV. Summary of Past Operation and Maintenance Projects**

General Maintenance: Below is a summary of maintenance projects and operation tasks performed since the completion of the Brady Canal Hydrologic Restoration (TE-28) project.

Under Article II of the Brady Canal Cost Share Agreement, the landowners, ConocoPhillips, formerly Burlington Resources and the Apache Minerals Corporation were granted in-kind service credits to repair existing earthen embankments within the project area. Below is a description of work and cost associated with the maintenance performed by the landowners:

##### In Kind Service Credits

7/30/2007 – Apache Corporation contracted Dupre Brothers Construction, Inc. of Houma, La. to repair several breaches along the east bank of Jug Lake and reinforce earthen embankment tie-ins adjacent to variable crest weir structures #21, #23, and #24. The repairs were completed on 7/30/2008 at a total cost of \$9,103.12

9/30/2006 – Conoco Phillips contracted Dupre Brothers, Inc. of Houma, La. to repair several breaches along Carencro Bayou, Little Carencro Bayou and Brady Canal using material from adjacent bayous. The total cost for refurbishment and repair of these breaches was \$25,890.

9/20/2006 - Apache Corporation contracted Frisco Construction Co. Inc. of Houma, La. to repair breaches and refurbish low areas of the spoil banks along the east bank of Jug Lake and embankment tie-ins adjacent to structures #21, #23 and #24. The repairs were completed on 9/20/2006 at a total cost of \$9,265.

10/31/2003 - Apache Corporation contracted Berry Bros. General Contractors to completed 5,050 linear feet of levee refurbishment along the west bank of Jug Lake. The cost for the levee refurbishment including construction oversight was \$34,284.87. Following the levee refurbishment, Shaw Coastal performed an as-built survey of the repairs at a cost of \$5,100.60. The total project cost for this maintenance event was \$39,385.47.

8/15/2003 – ConocoPhillips, formerly Burlington Resources, completed the repair of two (2) large breaches along Little Carencro Bayou following Hurricane Lili. The maintenance project was completed on 8/15/2003 at a total cost of \$31,642.57, including construction oversight and administration.

10/21/2002 - Apache Corporation contracted Frisco Construction Co. to repair and restore the existing levee embankment along Turtle Bayou, Superior Canal, and along the west bank of Jug Lake. This work was completed at a total cost of \$5,310,.

Brady Canal Breach Repair Project (2003) – LDNR: This maintenance project was completed on August 13, 2003 and included the installation of approximately 9,667 tons of riprap along the north bank of Bayou Decade, 2,325 linear feet of levee refurbishment and earthen breach repair along Turtle Bayou and Superior Canal, and replacement of a timber pile on the navigational aid structure at Weir 6. The cost associated with the engineering, design and construction of the 2003 Brady Canal Breach Repair Project is as follows:

Construction:	\$471,329.65
Engineering & Design:	\$ 54,473.00
Bidding:	\$ 4,100.00
Construction Administration:	\$ 8,020.00
Construction Oversight:	\$ 49,635.00
As-built Survey and Drawings:	<u>\$ 12,873.00</u>
Project Total:	\$600,430.65

Structure Operations: In accordance with the operation schedule outlined in the Operation and Maintenance Plan, Structures #14, #21, and #23 have been operated twice annually beginning in April 2002. Below is a summary of costs incurred for structure operations:

03/02	Pyburn & Odom	\$9,772.50
09/02	CEEC	\$4,674.00
03/03	CEEC	\$4,022.58
09/03	CEEC	\$3,612.93
03/04	Shaw Coastal	\$4,676.18
09/04	Shaw Coastal	\$5,365.25
03/05	T. Baker Smith	\$8,804.83

09/05	T. Baker Smith	\$8,886.60
03/06	T. Baker Smith	\$7,668.59
09/06	T. Baker Smith	\$9,970.37
03/07	T. Baker Smith	\$8,602.12
09/07	T. Baker Smith	\$9,203.61
03/08	T. Baker Smith	\$7,595.99
10/08	Apache Minerals	\$6,000.00
03/09	Apache Minerals	\$6,000.00
10/09	Apache Minerals	\$6,000.00
03/10	Apache Minerals	\$6,000.00
10/10	Apache Minerals	\$6,000.00
03/11	Apache Minerals	\$6,000.00
10/11	Apache Minerals	\$6,000.00
03/12	Apache Minerals	\$6,000.00

Prior to the scheduled operations in September 2008, the CPRA entered into a sole-source agreement with Apache Minerals for the landowner to assume responsibility of operating all water control structures associated with the Brady Canal (TE-28) project. The cost proposal submitted by Apache to complete this work in accordance with terms of the agreement is \$12,000, annually. Apache began structure operations in October 2008.

Navigational Aids Maintenance: During the operation and maintenance phase of the Brady Canal Hydrologic Restoration (TE-28) Project, the navigational aids at Structure 6 along Bayou Decade have been repaired several times. Below are the dates and costs associated with the repair and maintenance of these navigation lights:

2/2007 – LDNR received bids for a state-wide maintenance contract for inspection, diagnostic testing and maintenance of twenty-seven (27) navigational aid systems at ten (10) separate locations throughout the state. Four (4) the twenty-seven (27) navigational aid structures are located at Structure 6 within the Brady Canal project area. The total cost of the state-wide maintenance contract is approximately \$83,000 annually, with an option to extend the contract for an additional two (2) years. Inspections of the navigational aids at Structure 6 began in February 2007 under the current maintenance contract.

11/2003 – Ernest P. Breaux Electrical Inc. replaced 20 lamps, 4 – batteries, 1 – lamp changer, 1 – photo cell at structure 6. The cost for parts and labor to service these navigational aids was \$4,132.30.

8/2002 - Automatic Power, Inc. of Larose, La. performed trouble shooting services to determine a schedule of parts requiring replacement – Cost: \$465

8/2002 – B&B Electromatic of Norwood, La. repaired the navigation lights at structure 6 including parts and labor for a total cost of \$2,039.

## **V. Inspection Results**

### **Structure 6 – Fixed crest weir with barge bay**

Structure 6 appears to be in good overall condition. The steel bulkheads and embankment tie-ins show no signs of erosion or wash-outs. The navigational lights appear to be working and the navigational signs are visible despite some minor corrosion from exposure. As mentioned in previous inspection reports, the timber pile dolphins on the south side of the structure are cracked and displaced from their original placement. This damage is believed to be due to oilfield service barges using the timber pile dolphins to navigate the sharp turn from Bayou Decade. These timber repairs are included in the 2012 Maintenance Project which is going to bid on July 24, 2012. A water level reading of +1.0' NAVD88 was taken at approximately 11:15am from a project staff gauge near Structure 6. (See Appendix B, Photos 35 through 38)

### **Structure 7 – Rock Plug**

Structure 7 appears to be in good overall condition. There is no observed settlement of the rock plug or signs of erosion around the earthen embankment tie-ins. The warning signs and supports for this structure also appear to be in good condition. This structure does not require maintenance at this time. (See Appendix B, Photo #40)

### **Structure 10 – Stabilization rock armored channel liner**

This structure along Voss Canal seems to be in good overall condition. There was no structural damage observed to the channel liner and no additional settlement of the rock from previous inspections. A handheld depth sounder was used to record the water depth in the boat bay. A reading of 5.7' of water above the rock crest combined with the earlier water level reading of +1.0' NAVD88 implies the current crest of the structure is -4.7' NAVD88. As reported in previous inspection reports, the timber supports for the warning signs on the northeast side of the structure are no longer vertical. These timbers were recommended for replacement and are included in the 2012 Maintenance Project. (See Appendix B, Photos 44 through 47)

### **Structure 14 – fixed crest weir w/ variable crest section**

Structure 14 appears to be in good overall condition. There is no visible damage to the railings, platform, steel bulkhead, or warning signs and their timbers. As reported in previous inspection reports, there is some noticeable erosion near the embankment tie-ins. It appears to be caused by boat traffic, as the erosion can only be seen on the Bayou Carencro side of the structure. When compared to images from the 2011 annual inspection there are no indicators that the loss is progressing, and with no significant change there is no need to restore the tie-ins at this time. (See Appendix B, Photos 50 through 53)

**Structure 20 – Stabilization rock armored channel liner**

This structure is in fair condition. There has been some settlement of the rock rip rap on both the exposed sides and submerged crest of the structure. A handheld depth sounder was used to record the water depth in the boat bay. A reading of 6.7' of water above the rock crest combined with the earlier water level reading of +1.0' NAVD implies the current crest of the structure is -5.7' NAVD. When compared to its constructed height of -4.75' NAVD the crest has settled approximately 1.0'. All other warning signs and timber supports are in good condition. (See Appendix B, Photos 32 through 34)

**Structure 21 – fixed crest weir w/ three (3) variable crest sections**

Structure 21 is in fair condition. There is no visible damage to the steel bulkhead, railings, platform, or the warning signs and their support timbers. As reported in previous inspection annual reports, there is substantial erosion of the earthen embankment tie-ins. The steel bulkheads on both sides of the structure are exposed and a breach has formed on the northeast side of the structure. These earthen embankments are to be rebuilt in the 2012 Maintenance Project to repair the damage that has been done and to resume the effectiveness of the structure. (See Appendix B, Photos 26 through 28)

**Structure 23 – fixed crest weir w/ two (2) variable crest sections**

This structure is also in fair condition. There is no visible damage to the steel bulkhead, railings, platform, or the warning signs and their support timbers. However, there are large breaches on both of the earthen embankment tie-ins. The north tie-in has been repaired several times, so to prevent further damage, the earthen embankment tie-ins are to be rebuilt and armored with rock rip rap for 50' in both directions. These repairs are included in the 2012 Maintenance Project. (See Appendix B, Photos 20 through 24)

**Structure 24 – fixed crest weir**

Structure 24 is in good overall condition. The warning signs, timbers, railings and steel bulkhead show no signs of damage. The earthen embankment tie-ins are intact and holding well since their refurbishment in 2007. Although repairs are not immediately needed, past experience shows the tie-ins are vulnerable to erosion. Therefore, rock armoring of the tie-ins is included as an alternate in the 2012 Maintenance Project as a preemptive action to protect the structure. (See Appendix B, Photos 16 through 19)

**Earthen Embankments**

The inspection of the earthen embankments progressed from Superior Canal, Turtle Bayou, Bayou Decade, through Voss Canal, Bayou Carencro, and concluded along Brady Canal. All of the earthen banks along Superior Canal and Turtle Bayou are in good condition, there is

some variance in elevation and vegetative growth but no breaches or cut banks were observed during the inspection (See Appendix B, Photos 5 through 8). The earthen embankments along Bayou Decade and Voss Canal are also in good condition. These areas have seen some erosion but little to no change since the previous inspections. There is little threat of these areas breaching, therefore they have been omitted from the 2012 Maintenance Project (See Appendix B, Photo 41 and Photos 48 through 49).

The Jug Lake lake rim is the area of most concern throughout the entire project. Over the last several years the earthen rim has been subjected to strong storm systems, hurricanes Katrina, Rita, Gustav, and Ike, which have deteriorated the lake rim to a narrow barrier with several breaches. In addition to the hurricanes, there is very little marsh in the project area, thus exposing the thin barrier to high wave energies from both Jug Lake and the open water of the project area. The complete failure of this lake rim would be extremely detrimental to the project area as it renders three (3) water control structures ineffective and would allow large amounts of high saline water into an area that is predominantly brackish. The most critical areas of the lake rim have been selected to be refurbished in the 2012 Maintenance Project. Borrow material from the lake will be used to rebuild these areas.

### **Rock Armored Embankments**

Breach 7 located along the oil field access canal connecting to Superior canal is in good overall condition. There is no observed settlement along the length of the embankment and no erosion or washouts around the embankment tie-ins. There are no recommendations for corrective action at this time, but it will continue to be monitored on future inspections. (See Appendix B, Photos 1 through 4)

The rock armored embankments and rock dikes found along the north bank of Bayou Decade and Voss Canal are in good condition. The earthen embankment with rock revetment beginning at the intersection of Bayou Decade and Voss Canal had some initial settlement after construction but has experienced little change since previous inspections. The earthen embankment with rock revetment west of structure 7 along Bayou Decade appears to be in good condition with no apparent settlement. The rock dike along Bayou Decade between Jug Lake and Turtle Bayou appears to be in fair condition with isolated low areas and moderate displacement. Despite some minor deficiencies, the structures appear to be operating as intended, therefore there will be no repairs included in the 2012 Maintenance Project. (See Appendix B, Photos 10 through 11, Photo 39, Photos 42 through 43)

## **VI. Conclusions and Recommendations**

Since annual inspections of the Brady Canal Hydrologic Restoration (TE-28) project began in 2001, a number of deficiencies have been documented that will require maintenance and/or refurbishment. In January 2010, CPRA initiated maintenance of the Brady Canal Project – 2012 Maintenance Project by contracting Arcadis, Inc. of Baton Rouge to perform the design and the preparation of the necessary contract documents for maintenance of the deficiencies outlined in Section V of this report. The 2012 Maintenance Project will be the second major

maintenance event since the 2003 Maintenance Project to refurbish earthen embankments along Turtle Bayou, Superior Canal, and the installation of the rock dike along the north bank of Bayou Decade between Turtle Bayou and Jug Lake was completed. Prior to the design and plan preparations, CPRA contracted with T. Baker Smith, Inc. of Houma, La. to perform the necessary design surveys for the project. The initial survey for the project was completed at the end of May 2010; however, a task amendment was issued in June 2010 to collect additional data for deficiencies identified during the 2010 Annual Inspection. All survey work for design has been completed. In May 2011, the plans and specifications had been reviewed by NRCS and CPRA design section, and Arcadis, Inc. made the final corrections to address both state and federal comments. The modification to the existing permit was submitted for joint review to the DNR-CMD and COE. The project was bid in December 2011, and upon receiving the bids, all bids were rejected as they exceeded the project budget. CPRA and NCRS have decided to reduce the scope of the 2012 Maintenance Project to address the most critical areas along Jug Lake, the plans have been finalized and currently the project is in the bid process.

Below is a summary of the identified deficiencies and recommended methods of repair that will be included in the Brady Canal - 2012 Maintenance Project (Appendix D, 2012 Work Plan):

#### Structure 6 – Timber Cluster Pile Replacement

The timber cluster pile replacement shall include removal of two (2) existing timber pile structures on the south side of Structure 6 and replacing them with new treated timber piles, supports, cables and hardware. It is also recommended that the new structure be more rigid with additional lateral support. This could be accomplished by adding another batter pile to the timber pile cluster.

#### Structure 10 – Warning Sign Replacement

Warning sign replacement shall include the removal of three (3) existing timber piles and signage and replacement with new material including timber piles, hardware and warning signs.

#### Structure 21, 23 and 24 – Variable Crest Weir Structures

The variable crest weir structures along the rim of Jug Lake will have their earthen embankment tie-ins refurbished during the 2012 Maintenance Project. This will consist of utilizing fill material from the lake bed to rebuild their tie-ins to the original design specifications. In addition to the earthen embankments, it is recommended that the tie-ins be armored with rock riprap 50 linear feet in both directions to prevent further erosion and breaches. Due to the high cost of rock riprap placement, the armoring of Structure 23, which has a history of breaches and is in the worst condition of the three weirs, has been included in the base bid of the 2012 Maintenance Project. The armoring of Structures 21 and 24 have been included in the project as Alternate Bids #1 and #2 respectively, as these have experienced less erosion and will be armored with rock riprap if the budget allows.

### Earthen Embankments – Jug Lake

The refurbishment of the lake rim shall include clearing and grubbing trees and brush along 13,900 linear feet of the existing rim and excavating material from the lake bottom to restore the rim to the original designed section, followed by seeding of approximately 20 acres of the repaired lake rim. Due to budget restraints, only the areas of most concern along the lake rim were chosen to be refurbished, and these areas can be seen in Appendix D, 2012 Work Plan.

### Earthen Embankments – Breach 6

Due to the depth of Breach 6 and the close proximity to an existing timber bulkhead, the breach will be closed using rock riprap. Prior to placement of the rock riprap material, a geotextile fabric shall be used to line the breach and adjacent bank. The breach closure shall be constructed to the existing elevation of the timber bulkhead.

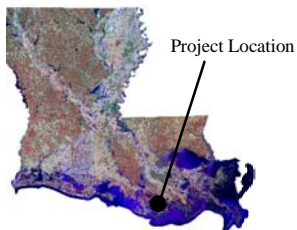
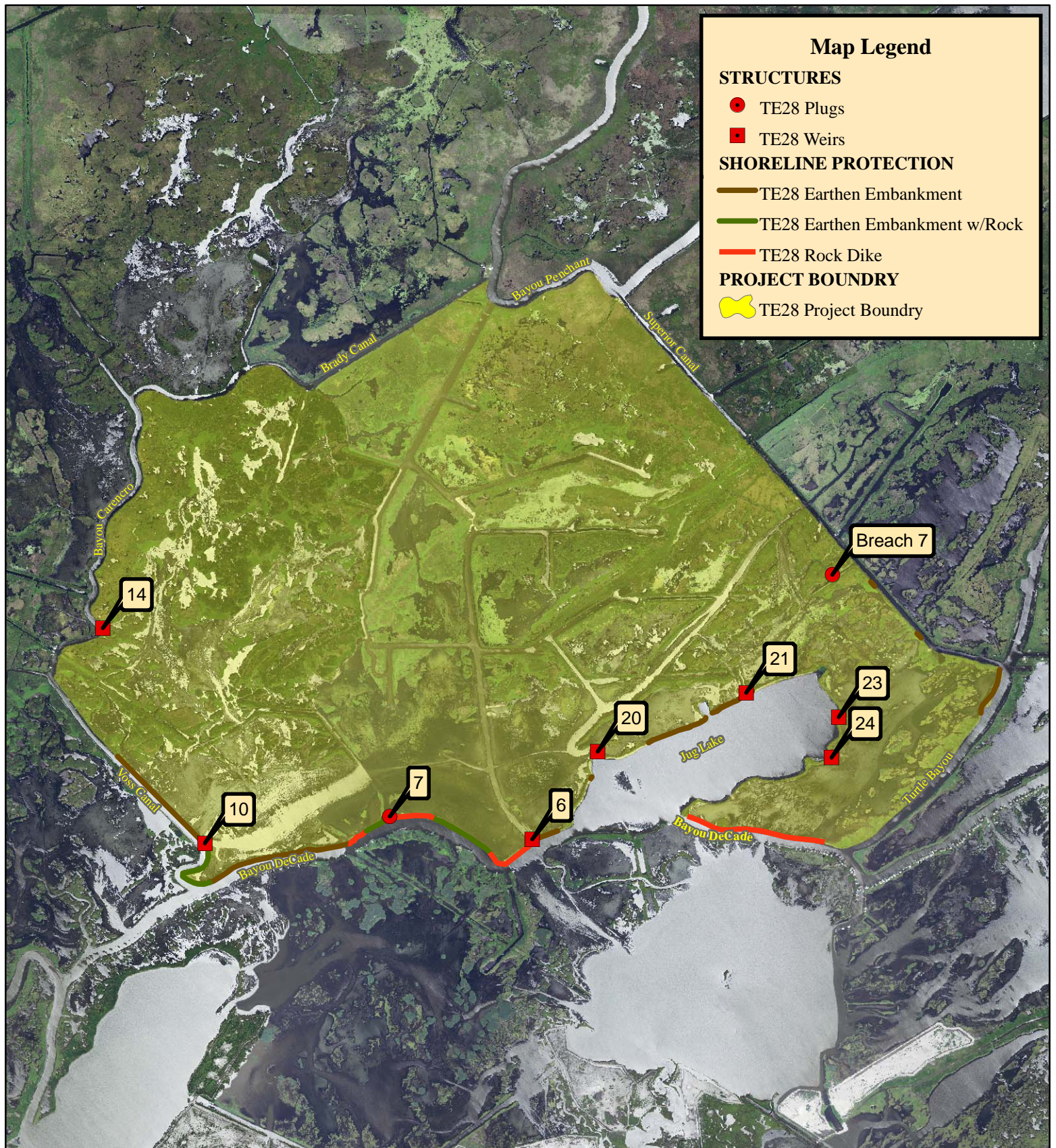
### References:

Folse, T. August 2003. Monitoring Plan for the Brady Canal Hydrologic Restoration Project (TE-28), Louisiana Department of Natural Resources, Coastal Restoration Division, 16pp.

Louisiana Department of Natural Resources – Coastal Restoration Division and Pyburn and Odom, Inc. 2002. Operation, Maintenance and Rehabilitation Plan for the Brady Canal Hydrologic Restoration Project (TE-28)

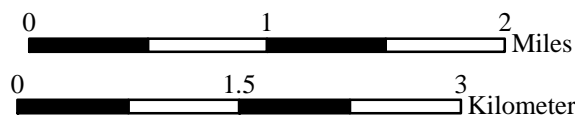
United States Department of Agriculture – Natural Resources Conservation Service 1995. Project Plan and Environmental Assessment for the Brady Canal Hydrologic Restoration Project.

**Appendix A**  
**Project Features Map**



## TE28 - Brady Canal Hydrologic Restoration

### PROJECT FEATURES MAP



Data Source:

Coastal Protection and  
Restoration Authority  
Operations Division  
Thibodaux Field Office

2010 NAIP Aerial

Date: August 2011

## **Appendix B**

### **Photographs**



Photo #1: Breach 7 located in an oilfield access canal off of Superior Canal. View of northeast embankment tie-in obscured by vegetation.



Photo #2: Breach 7 located in an oilfield access canal off of Superior Canal. No visible settlement or displacement of rock fill material.



Photo #3: Breach 7 located in an oilfield access canal off of Superior Canal. View of southwest embankment tie-in obscured by vegetation.



Photo #4: Breach 7 located in an oilfield access canal off of Superior Canal. An overall view of the breach looking north from canal.



Photo #5: Earthen embankment along Superior Canal. View of embankment looking southwest from Superior Canal.



Photo #6: Earthen embankment along Superior Canal. View of embankment looking southwest from Superior Canal.



Photo #7: Earthen embankment along Turtle Bayou. View of embankment looking northwest from Turtle Bayou.



Photo #8: Earthen embankment along Turtle Bayou. View of embankment looking northwest from Turtle Bayou.



Photo #9: Earthen embankment along Bayou Decade. View of embankment looking north from Bayou Decade.



Photo #10: View of Bayou Decade Rock Dike looking north. There was no observed settlement of the rock dike from previous years.



Photo #11: View of Bayou Decade Rock Dike looking north. There was no observed settlement of the rock dike from previous years.



Photo #12: Southeast lake rim, view from Jug Lake looking southeast. This area has substantial deterioration and is scheduled to be rebuilt in the 2012 maintenance event.



Photo #13: Large Breach located in southeast lake rim, view looking east from Jug Lake. It is a pre-existing breach approximately 40 feet wide to be repaired in 2012 maintenance event.



Photo #14: Large Breach located in southeast lake rim, view looking southeast from Jug Lake. It is a pre-existing breach approximately 40 feet wide to be repaired in 2012 maintenance event.



Photo #15: Low area in the southeast lake rim, view looking southeast from Jug Lake.



Photo #16: View of Structure 24 from Jug Lake looking east. The southern embankment tie-in of structure 24 is in good overall condition.



Photo #17: View of Structure 24 from Jug Lake looking east. The northern embankment tie-in of structure 24 is also in good overall condition.



Photo #18: View of Structure 24 from Jug Lake looking east. Close up of the warning signs, support timbers, and barricades on the structure.



Photo #19: An overall view of Structure 24 from Jug Lake looking east.



Photo #20: An overall view of Structure 23 from Jug Lake looking northeast. Structure 23 has experienced erosion around both its embankment tie-ins.



Photo #21: South embankment tie-in of structure 23 looking east. To be reconstructed and rock armored in the 2012 maintenance event.



Photo #22: North embankment tie-in of structure 23 looking east. To be reconstructed and rock armored in the 2012 maintenance event.



Photo #23: Close up view of the warning signs, support timbers, barricades, and railings of Structure 23, looking east from Jug Lake.



Photo #24: An overall view of Structure 23 from Jug Lake looking southeast.



Photo #25: Low section along the northeast lake rim between structure 23 and structure 21, view looking northeast from Jug Lake.



Photo #26: Embankment tie-in on northeast side of Structure 21 has been breached and allows water to flow around the structure, view looking north from Jug Lake.



Photo #27: An overall view of Structure 21 looking north from Jug Lake. Embankment tie-ins to be reconstructed during the 2012 maintenance event.



Photo #28: Embankment tie-in on southwest side of Structure 21 has been eroded but does not allow water to flow around the structure, view looking north from Jug Lake.



Photo #29: View of low section in lake rim along northwest Jug Lake, looking northwest.



Photo #30: View of low section in lake rim along northwest Jug Lake, looking northwest.



Photo #31: View of breach in lake rim along northwest Jug Lake, looking northwest. The size of the breach has increased since 2011 annual inspection.



Photo #32: Overall view of Structure 20 looking northwest from Jug Lake. All warning signs and support timbers are in good condition.



Photo #33: View of the eastern embankment tie-in of Structure 20 is obscured by vegetation, looking northeast from Jug Lake.



Photo #34: Additional view of Structure 20 warning signs and support timbers looking south from navigational canal.



Photo #35: View of the eastern end of Structure 6 and rock armored embankment, looking north from Bayou Decade.



Photo #36: View of the eastern embankment tie-in of Structure 6, looking north from Bayou Decade. The timber dolphin is damaged and its repair is included in the 2012 maintenance event.



Photo #37: Overall view of the western end of Structure 6, looking south from navigational canal.



Photo #38: View of the western embankment tie-in of Structure 6, looking south from navigational canal. There is no visible erosion or breaching around the tie-in



Photo #39: View of rock dike along Bayou Decade just west of Structure 6, looking north from Bayou Decade.



Photo #40: View of Structure 7 Rock Plug along Bayou Decade, looking north from Bayou Decade. There is no observed settlement of the rock, and the signs and supports are in good shape.



Photo #41: View of earthen embankment along Bayou Decade, located just west of Structure 7, looking north from Bayou Decade.



Photo #42: View of rock armored embankment located at the intersection of Bayou Decade and Voss Canal, looking northeast from Bayou Decade.



Photo #43: View of rock armored embankment along Voss Canal, looking east from Voss Canal.

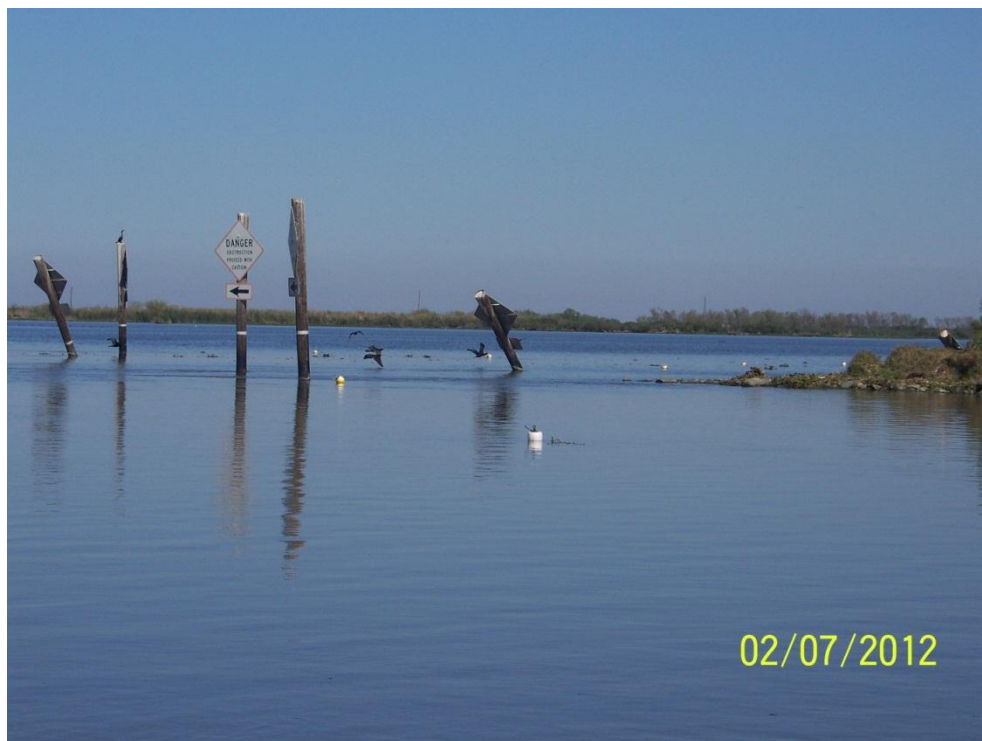


Photo #44: View of Structure 10 from Voss Canal looking east. There are several down warning signs for Structure 10 to be replaced in the 2012 maintenance event.



Photo #45: View of a fallen sign on the southern end of Structure 10, looking northeast from Voss Canal.



Photo #46: View of a fallen sign on the northern end of Structure 10, looking north from inside the rock weir.



Photo #47: Overall view of Structure 10 looking southeast from Voss Canal.



Photo #48: View of earthen embankment along Voss Canal, looking northeast from Voss Canal. No additional breaches were found between Structures 10 and 14.



Photo #49: View of earthen embankment along Voss Canal, looking northeast from Voss Canal. No additional breaches were found between Structures 10 and 14.



Photo #50: View of southern embankment tie-in of Structure 14, looking east from Bayou Carencro. Both tie-ins show signs of erosion on the canal side but have not been breached.



Photo #51: Overall view of Structure 14 looking east from Bayou Carencro.



Photo #52: View of northern embankment tie-in of Structure 14, looking east from Bayou Carencro.  
Both tie-ins show signs of erosion on the canal side but have not been breached.



Photo #53: Close-up view of Structure 14 looking east from Bayou Carencro.



Photo #54: View of earthen embankment along Bayou Carencro, looking southeast from Bayou Carencro.



Photo #55: View of a breach identified during the 2012 annual inspection. Location in Bayou Carencro close proximity to point N29 24m 16.5s, W90 59m 52.5s



Photo #56: View of a breach identified during the 2012 annual inspection. Location in Bayou Carencro close proximity to point N29 24m 32.1s, W90 59m 05.6s

## **Appendix C**

### **Three Year Budget Projection and Worksheets**

**Brady Canal/ TE-28 / PPL 3**  
**Three-Year Operations & Maintenance Budgets 07/01/2012 - 06/30/15**

<u>Project Manager</u>	<u>O &amp; M Manager</u>	<u>Federal Sponsor</u>	<u>Prepared By</u>
	<i>Adam Ledet</i>	NRCS	<i>Adam Ledet</i>

	2012/2013	2013/2014	2014/2015
<b>Maintenance Inspection</b>	\$ 6,268.00	\$ 6,456.00	\$ 6,650.00
<b>Structure Ops/ Nav Aid</b>	\$ 17,000.00	\$ 17,000.00	\$ 17,000.00
<b>OCPR Administration</b>	\$ 37,500.00	\$ 2,500.00	\$ 2,500.00
<b>Maintenance/Rehabilitation</b>	\$ -	\$ -	\$ -

12/13 Description: Structure Operation, Navigational Aid maintenance and repairs

E&D	\$52,087.00
Construction	\$910,400.00
Construction Oversight	\$127,500.00
Sub Total - Maint. And Rehab.	\$ 1,089,987.00

13/14 Description: Structure Operatons, Navigational Aid maintenance and repairs

E&D	\$ -
Construction	\$ -
Construction Oversight	\$ -
Sub Total - Maint. And Rehab.	\$ -

14/15 Description: Structure Operations, and Navigational AidMaintenance

E&D	\$ -
Construction	\$ -
Construction Oversight	\$ -
Sub Total - Maint. And Rehab.	\$ -

	2012/2013	2013/2014	2014/2015
<b><u>Annual O&amp;M Budgets</u></b>	<b>\$ 1,150,755.00</b>	<b>\$ 25,956.00</b>	<b>\$ 26,150.00</b>

<b><u>O &amp; M Budget (3 yr Total)</u></b>	<b>\$ 1,202,861.00</b>
<b><u>Unexpended O &amp; M Funds</u></b>	<b>\$1,221,783.00</b>
<b><u>Remaining O &amp; M Budget (Projected)</u></b>	<b>\$18,922.00</b>

## OPERATIONS & MAINTENANCE BUDGET WORKSHEET

### Project: TE-28 Brady Canal Hydrologic Restoration

**FY 12/13 –**

Administration		\$	2,500*
O&M Inspection & Report		\$	6,268
Operation/Navigational Aid:		\$	17,000**
Maintenance:		\$	1,124,987
E&D:	\$	52,087	
Construction:	\$	910,400	
Construction Oversight:	\$	127,500	
CPRA Admin:	\$	35,000	

#### **Operation and Maintenance Assumptions:**

Structure Operations: 3 – structures are operated twice annually by landowner for a total \$12,000\*\*, OCPR Navigational Aid inspection, maintenance and repairs: \$5,000\*\*  
CPRA Administration: \$2,500

#### **Brady Canal (TE-28) Hydrologic Restoration – 2012 Maintenance Project**

Revised Construction Estimated Based on reduction in scope:

Reductions Include:

- Reduce linear feet of Embankment Construction from 20,000 to 14,000
- Remove armoring from Structures 21 and 24
- Reduce armor embankment from 100' on each side of Structure 23 to 50'.
- Reduce geotextile fabric from 7,700 square yards to 1,300 sq.yards.
- Reduce seeding from 32 acres to 23 acres.

Description	Unit Cost	Total
Mobilization/Demobilization:	Lump Sum	\$ 100,000
Clearing/Grubbing:	Lump Sum	\$ 80,000
Magnetometer Survey:	Lump Sum	\$ 35,000
130lb Class Rock (Structure 23): (1,500 tons)	\$90/ton	\$ 135,000
Breach Repair (Timber Bulkhead): (500 tons)	\$90/ton	\$ 45,000
Dolphin Repair:	Lump Sum	\$ 45,000
Geotextile Fabric: (1,300 sq.yard)	\$15/sq.yd.	\$ 19,500

Seeding: (23 acres)	\$2,000/acre	\$ 46,000
Embankment Construction: (10,900 linear ft.)	\$36/linear ft.	\$ 392,400
<b>Embankment Construction:</b> <b>(2,322 linear ft.)</b>	<b>\$36/linear ft.</b>	<b>\$ 83,600 (FEMA)</b>
Temporary Warning Signs: (2 each)	\$2,500/each	\$ 5,000
Permanent Warning Signs: (3 Each)	\$2,500/each	<u>\$ 7,500</u>
<b>Total Construction Costs:</b>		<b>\$ 994,000</b>
<b>Total Construction Cost (Less FEMA \$83,600)</b>		<b>\$ 910,400</b>

**Remaining Overall 2012 Maintenance Project Budget Estimate:**

Design Plans and Specifications:	\$ 52,087*
Design Surveys:	\$ 0*
Construction Inspection: (1500 hrs @ \$65/hr)	\$ 97,500 (est.)
Construction Administration: (300 hrs @ \$100/hr)	\$ 30,000 (est.)
OCPR Administration:	<u>\$ 35,000 (est.)</u>
<b>Total E&amp;D and Construction Oversight:</b>	<b>\$214,587</b>

<b>Remaining Overall 2012 Maintenance Project Budget:</b>	<b>\$1,124,987</b>
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To be billed – Not on Lana Report\*

**FY 13/14 –**

Administration	\$ 2,500*
O&M Inspection & Report	\$ 6,456
Operation/Navigational Aid:	\$ 17,000**
Maintenance:	\$ 0
E&D:	\$ 0
Construction:	\$ 0
Construction Oversight:	\$ 0

**Operation and Maintenance Assumptions:**

Structure Operations: 3 – structures are operated twice annually by landowner for a total \$12,000\*\*, OCPR Navigational Aid inspection, maintenance and repairs: \$5,000\*\*  
CPRA Administration: \$2,500

**FY 14/15 –**

Administration			\$ 2,500*
O&M Inspection & Report			\$ 6,650
Operation/Navigational Aid:			\$ 17,000**
Maintenance:			\$
E&D:	\$	0	
Construction:	\$	0	
Construction Oversight:	\$	0	

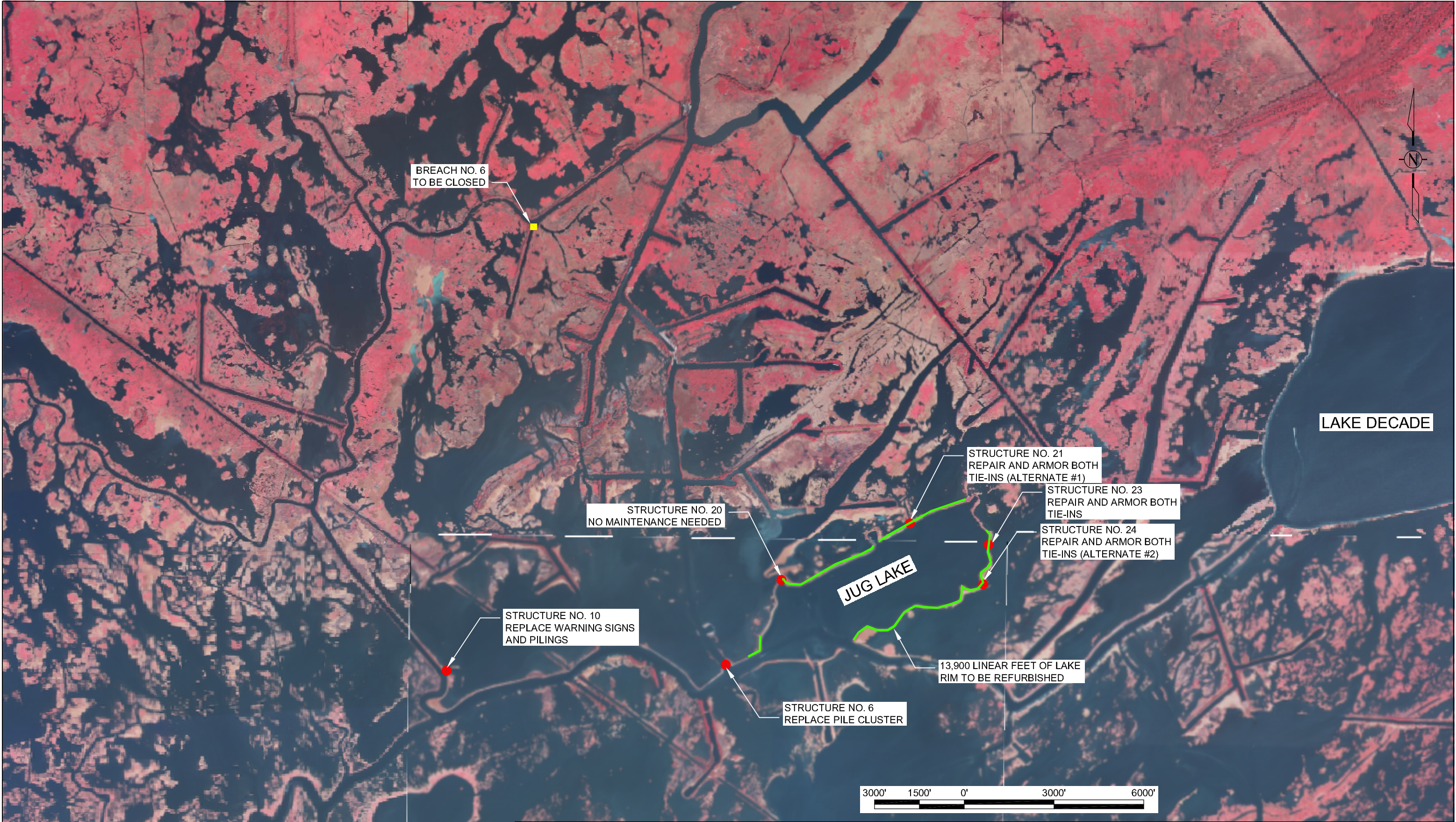
**Operation and Maintenance Assumptions:**

Structure Operations: 3 – structures are operated twice annually by landowner for a total \$12,000\*\*, OCPR Navigational Aid inspection, maintenance and repairs: \$5,000\*\*  
CPRA Administration: \$2,500

**2012-2015 Accounting**

Unexpended Funds (from Lana Report)	\$1,420,580.63
OCPR Expenditure	\$ 104,713.75
NRCS MIPR	\$ 94,008.00
<b>Total Unexpended Funds</b>	<b>\$1,221,783.88</b>

**Appendix D**  
**2012 Work Plan**



REV.	DATE	DESCRIPTION	BY

OFFICE OF COASTAL PROTECTION & RESTORATION ENGINEERING BRANCH 450 FLORIDA STREET BATON ROUGE, LOUISIANA 70801	
DRAWN BY: SJT	DESIGNED BY: BJB

BRADY CANAL HYDROLOGIC RESTORATION PROJECT	
STATE PROJECT NUMBER: TE-28	
FEDERAL PROJECT NUMBER: PTE-26b	
APPROVED BY:	

2012/2013 WORK PLAN MAP	
DATE: AUGUST 2011	
SHEET 1 OF 1	